UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

UNIVERSITY OF OKLAHOMA

DOCKET NO. 50-112

AMENDMENT TO FACILITY LICENSE

Amendment No. 12
License No. R-53

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment filed by the University of Oklahoma (the licensee), dated October 15, 1987, as supplemented, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations as set forth in 10 CFR Chapter I;

   B. The facility will be maintained in conformity with the application, provisions of the Act, and the regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied; and

   F. Publication of notice of this amendment is not required since it does not involve a significant hazards consideration nor amendment of a license of the type described in 10 CFR Section 2.106(a)(2).

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2. Facility License No. R-53 is hereby amended in its entirety to read as follows:

   A. This license applies to the Model AGN-211P, nuclear reactor that is owned by the University of Oklahoma and located on the licensee's campus in Norman, Oklahoma, and described in the licensee's application for license renewal dated October 5, 1978, as supplemented.

   B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses the University of Oklahoma:

      1. Pursuant to Section 104c of the Act and 10 CFR, Chapter I, Part 50, "Domestic Licensing of Production and Utilization Facilities," to possess, but not operate, the facility at the designated location in Norman, Oklahoma in accordance with the procedures and limitations described in the application and this license;

      2. Pursuant to the Act and 10 CFR, Chapter I, Part 70, "Domestic Licensing of Special Nuclear Material," to possess, but not to use, up to 1700 grams of contained uranium-235; and

      3. Pursuant to the Act and 10 CFR, Chapter I, Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to possess, but not to separate such byproduct material as may be produced by operation of the reactor.

   C. This license shall be deemed to contain and is subject to the conditions specified in Parts 20, 30, 50, 51, 55, 70 and 73 of 10 CFR, Chapter I, to all applicable provisions of the Act, and to the rules, regulations and orders of the Commission now or hereafter in effect, and to the additional conditions specified below:

      1. <u>Operation</u>

         The licensee shall not operate the reactor nor install fuel or experiments within the reactor core or core area.

      2. <u>Technical Specifications</u>

         The Technical Specifications contained in Appendix A, as revised through Amendment No. 12, are hereby incorporated in the license. The licensee shall maintain the facility in accordance with the Technical Specifications.

3. Physical Security Plan

The licensee shall maintain and fully implement all provisions of the Commission's approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of a document withheld from public disclosure pursuant to 10 CFR 2.790(d), entitled "Physical Security Plan, University of Oklahoma, Nuclear Reactor AGN-211P, License No. R-53" (consists of a document dated January 11, 1988 which was submitted by letter dated January 21, 1988).

3. This license is effective as of the date of issuance and shall expire at midnight November 14, 2003.

FOR THE NUCLEAR REGULATORY COMMISSION

Dennis M. Crutchfield

Dennis M. Crutchfield, Director
Division of Reactor Projects - III, IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
Appendix A Technical Specifications

Date of Issuance: March 8, 1988

APPENDIX A

LICENSE NO. R-53

TECHNICAL SPECIFICATIONS

FOR

THE UNIVERSITY OF OKLAHOMA

REACTOR MODEL AGN-211P (S.N. 102)

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1.0 DEFINITIONS

Quarterly - is defined as 3 months not to exceed 4 months.

Semi-Annually - is defined as 6 months but not to exceed 7 months.

Annually - Annually is defined as 12 months but not to exceed 14 months.

Shutdown Margin - The shutdown margin is defined as the amount of negative reactivity by which the reactor is shutdown with the most reactive rod stuck out of the core.

Reactor Secured - The reactor shall be considered secured when:

(1) It contains insufficient fissile material or moderator present in the reactor, adjacent experiments or control rods, to attain criticality under optimum available conditions of moderation and reflection, or

(2) No work is in progress involving core fuel, control rods or control rod drives unless they are physically decoupled from the reactor, and

(3) The console key switch is in the off position, the key is removed from the lock and the reactor console has been disconnected from the power supply.

SAFSTOR or Mothball - The reactor facility is considered to be in a SAFSTOR or mothballed condition when the facility is in a state of protective storage. The facility may be left intact except that all fissionable materials shall be removed from the reactor pool. The reactor fuel shall be in storage containers located in a fuel storage area. Appropriate surveillance, radiation monitoring, and security procedures are established under a possession-only license to ensure that the health and safety of the public is not endangered.

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

Not Applicable. The reactor shall remain secured and the facility shall be in mothball status.

3.0 LIMITING CONDITIONS FOR OPERATION

Not Applicable. The reactor shall remain secured and the facility shall be in mothball status.

4.0 SURVEILLANCE REQUIREMENTS

Actions specified in this section are applicable to the mothballed condition of the facility and shall be performed within the specified surveillance period.

4.1 Facility Support and Protection Systems

Applicability

This specification applies to the facility support and protection systems such as physical barriers, and radiation monitoring activities.

Objective

To assure that the public health and safety are not endangered as a result of physical degradation of the facility during the term of the possession-only license period.

Specification

a. Physical barriers to unauthorized entrance into the reactor facility and fuel storage area, e.g., building, rooms, doors, and access openings, shall be visually inspected at least once quarterly.

b. Fuel storage containers and container locking rings shall be visually inspected at least quarterly.

c. A radiation survey of the reactor facility and fuel storage area shall be performed at least semi-annually.

d. Radiation survey instruments shall be calibrated semi-annually.

Bases

The physical barriers, e.g. building, rooms doors, and access openings are inspected to assure that these barriers have not deteriorated and that locks and locking apparatus are intact.

Storage containers and container locking rings are inspected to assure integrity of the containers. This inspection, in conjunction with the annual fuel inventory and radiation survey of the fuel storage area will verify that radioactive material has not been removed from the containers or is not escaping or being transported through the containment barriers. In addition, the radiation survey provides assurance that radiation doses to facility personnel and to the public are maintained at a level below 10 CFR 20 limits.

5.0 DESIGN FEATURES

5.1 Mothball Status of the Reactor

During a mothballed state of protective storage:

a. The reactor fuel is removed from the pool.

b. All fissionable material used in connection with operation of the reactor is stored in approved storage containers with $k<0.8$, containing less than 400 grams of U-235 each, and is located in a designated, controlled fuel storage area in accordance with paragraph 5.2 of these technical specifications.

5.2 Fuel Storage

Fuel, including fuel devices, shall be stored in locked rooms in the reactor building. The storage array shall be such that K_{eff} is no greater than 0.8 for all conditions of moderation and reflection.

6.0 ADMINISTRATIVE CONTROLS

6.1 Organization of Responsibility for the University of Oklahoma Nuclear Reactor - Administrative control of the reactor is diagrammed in Figure 1.

6.1.1 President - Chief Executive Officer of the University

6.1.2 Provost - Chief Academic Officer

6.1.3 V.P. for Administrative Affairs - Chief Administrative Officer

6.1.4 Dean of Engineering - Administrative Officer in charge of the College of Engineering

6.1.5 Director, School of Aerospace, Mechanical and Nuclear Engineering (AMNE) - The Director is the head of the three degree programs, Aerospace, Mechanical and Nuclear Engineering. The Director will provide proper financial and technical support to ensure the mothball status of the facility is maintained in accordance with all requirements.

6.1.6 Reactor Director - Responsible for the general administration of the facility. In this capacity the Director shall have the authority and responsibility for the facility and, within the limitations set forth by the facility license, shall make policy decisions on all matters concerning the safety of the mothball status of the fuel and is advised by the Reactor Safety Committee, the Radiation Safety Committee and the University Radiation Safety Officer.

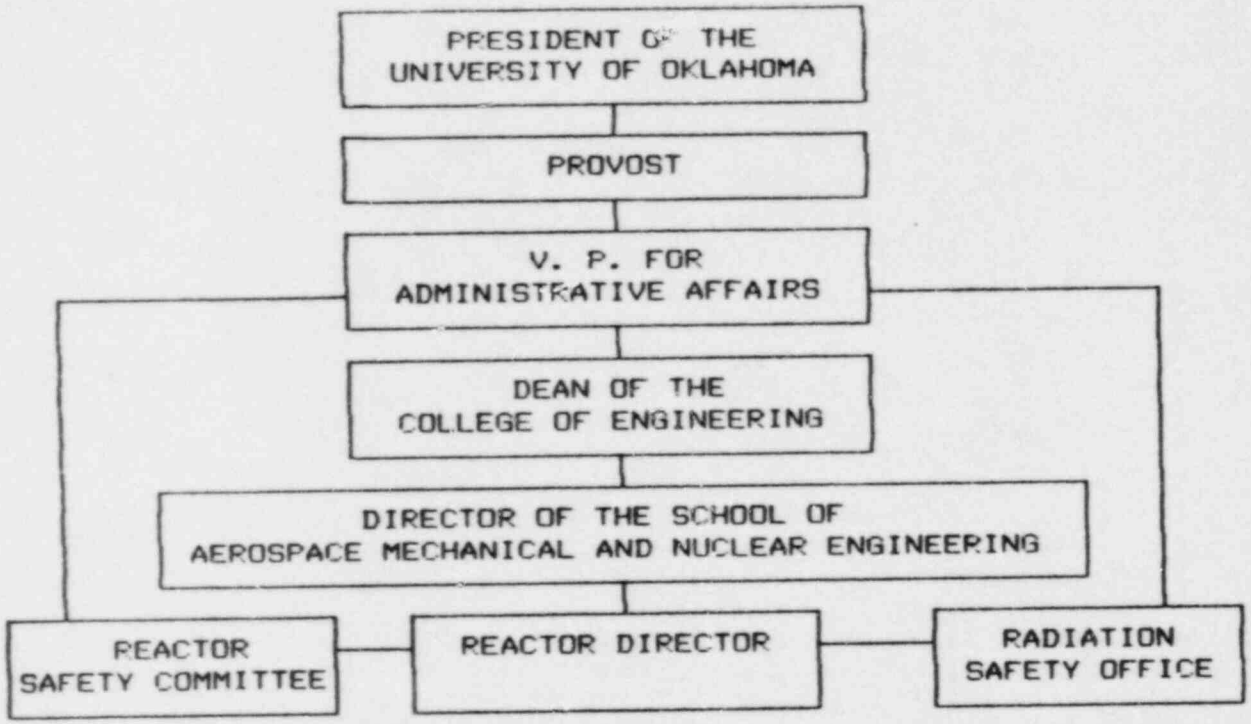

Figure 1. Administrative Organization of the OU Reactor.

6.1.7 Reactor Supervisor - Position not needed during time the reactor is in a mothball status.

6.1.8 University Radiation Safety Officer (RSO) - Has over-all responsibility for radiological safety at the University and shall assure that necessary radiation surveys are conducted in the Reactor, fuel storage, and other associated laboratories

The Radiation Safety Officer shall review the radiological safety aspects of the fuel storage and shall advise the Reactor Director in all matters relative to radiological safety. The RSO will be a member of the Reactor Safety Committee and the Radiation Safety Committee.

6.1.9 Reactor Staff Qualifications - The Reactor Director and any reactor technicians shall meet the minimum qualifications set forth in ANS 15.4, "Standards for the Selection and Training of Personnel for Research Reactors." The qualifications of a certified health physicist shall be acceptable.

6.2 Reactor Safety Committee -

6.2.1. The Reactor Safety Committee (RSC) shall be composed of not less than four members appointed by the Vice-President for Administrative Affairs, two of whom will be the Radiation Safety Officer and the Reactor Director.

6.2.2. A minimum of fifty percent (50%) of the membership shall constitute a quorum. A minimum quorum shall not be constituted with more than two committee members from the operating staff.

6.2.3. The committee shall have a maximum of three members appointed from the reactor operating staff.

6.2.4. Minutes of the meeting shall be taken and submitted to each member of the committee along with reports presented the committee.

6.2.5. Ad hoc subcommittees may be convened at the request of the chair and will report their findings to the committee.

6.2.6. The chair shall be appointed by the Vice-President for Administrative Affairs. The chair shall be responsible to call the committee into session at least semi-annually and shall make assignments as necessary to the members of the committee. The chair will be responsible for the recording of the minutes and the dissemination of committee reports and minutes. The chair or chair's designate shall have signature authority for the committee.

6.2.7. Committee members shall have duties and authority as assigned by the chair.

6.2.8. The committee shall review and approve the comprehensive safety aspects of the fuel storage. Review and approval by the RSC will include a determination that any previously unreviewed safety question does not pose a hazard to the reactor, reactor personnel, or the environment as defined in 10CFR 50. Its duties shall include, but not be limited to the following:

A) Review and approve safety standards associated with the mothballed status of the reactor facility which are consistent with the technical specifications of the reactor.

B) Review and approve procedures as required by the technical specification for rearrangement of fuel, surveillance, and security of the fuel.

C) Review and approve procedures for the modification and/or testing of replacement components associated with the radiation monitoring and fuel storage security systems.

D) Review and approve standard procedures for audit and review of the surveillance procedures required by the technical specifications and security plan.

E) Audit performance at least annually of the reactor staff in the areas facilities manual (procedures), maintenance logs and test procedures, surveillance tests, and physical security plan.

F) Review all abnormal occurrences and violations of the technical specifications, evaluating the causes of such events, the corrective action taken and recommending measures to prevent the recurrence of the incident. Report their findings to all authorities as required by the technical specifications and University authority.

6.3 Reporting Requirements

6.3.1 Annual Report. An annual report describing the status of the facility, the results of environmental and facility radiation survyes, an evaluation of the performance of security and surveillance measures, personnel exposures to radiation, and any abnormal occurrences during the previous calendar year shall be submitted to the Director of Nuclear Reactor Regulation prior to May 31, of each calendar year.

6.3.2 Reportable Occurrences. Reportable occurrences shall be reported as expeditiously as possible by telephone and confirmed by telegraph, mailgram or facsimile transmission to the NRC Operations Center (202) 951-0550, no later than the first work day following the event. A written followup report describing the reportable occurrance including causes, probable consequences, corrective actions, and measures to prevent recurrence shall be submitted within 14 days. Information provided shall contain narrative material for a complete explanation of the circumstances surrounding the event. The following events shall be reported:

a. Discovery of significant, unexplained increase in radiation or contamination levels within or around the reactor facility or fuel storage area.

b. Abnormal degradation discovered in protective barriers for the reactor facility or fuel storage area which would compromise the physical security established for protective storage of the reactor and reactor fuel.

6.3.3 Special Reports. Special reports which may be required by the Nuclear Regulatory Commission shall be submitted to the Director of the appropriate NRC Regional Office within the time period specified for each report.

6.4 Procedures. There shall be written procedures for the following.

1. Surveillance and testing of equipment and systems required for protective storage of the reactor and reactor fuel.

2. Personnel radiation protection consistent with 10 CFR 20.

3. Access control to the reactor facility and fuel and storage area.

4. Implementation of the security plan.

5. Notification of the proper authorities in the event of significant changes in the radiation or contamination levels within the facility.

6.5 Record Retention

6.5.1 SAFSTOR Records. Retention records or logs relative to the following items shall be kept and retained until the license is terminated, unless otherwise specified by the NRC:

a. Facility radiation surveys.
b. Inspections of physical barriers.
c. Abnormal occurrences.
d. Environmental Surveys

6.5.2 Prior Facility Operation Records.

Records or logs relative to the following items shall be retained for a period of at least ten years:

a. Operating logs or data which shall identify:

1. Completion of pre-startup checkout, start-up, power changes, and shutdown of the reactor.

2. Installation or removal of fuel elements, control rods, or experiments that could affect core reactivity.

3. Installation or removal of jumpers, special tags or notices, or other temporary changes to reactor safety circuitry.

4. Rod worth measurements and other reactivity measurements.

b. Principal maintenance operations.

c. Reportable occurrences.

d. Surveillance activities required by technical specifications.

e. Facility radiation and contamination surveys.

f. Experiments performed with the reactor.

g. Changes to operating procedures.

6.5.3 Other Records

Records or logs relative to the following items shall be retained for the life of the facility, unless otherwise specified by the NRC:

a. Gaseous and liquid radioactive effluents released to the environment.

b. Appropriate off-site environmental monitoring surveys.

c. Fuel inventories and fuel transfers.

d. Radiation exposures for all personnel.

e. Updated as-built drawings of the facility.

f. Records of transient or operational cycles for those components designed for a limited number of transients or cycles.

g. Records of training and qualifications for members of the facility staff.

h. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59.

i. Records of meetings of the Reactor Safety Committee.